

ABSTRACT

Borrow areas are created where soil is removed to provide needed fill material for highway and other construction projects. Where these areas are located beyond the highway right-of-way, they must be restored and returned to useful purposes. In Iowa, borrow areas are often developed on agricultural lands and therefore, it is necessary to return them to agricultural uses whenever possible. This research project was established to evaluate the changes in row crop productivity where borrow is removed for highway construction. Secondly, several reclamation techniques were selected to be applied to borrow area research sites and the response of crops to each treatment will be evaluated.

Four type locations representative of a range of major soil materials in Iowa were designated for the study:

1. Coarse textured (sandy) material - Buchanan County
2. Calcareous loess in western soil - Audubon County
3. Late Wisconsin glacial till in north central Iowa - Hamilton County
4. Weathered loess of glacial till in eastern or southern Iowa - Lee County

Recommendations

1. Topsoil replacement is not always necessary. At coarse-textured sites which include loess and sandy materials, excellent yield may be obtained with no topsoil replacement. Fertility levels at these sites can be built up rapidly with commercial fertilizer.
2. Alfalfa treatment should be considered for the first years following reclamation of a borrow pit. In some instances, other legumes such as red clover or birdsfoot trefoil should be used instead of alfalfa. Where topsoil is not restored, a legume treatment should be mandatory to reduce soil erosion.
3. Subsoil tillage generally was not beneficial for row crops.
4. Manure application was beneficial to corn grown in the first year after its application. However, excellent corn yields could be achieved without manure.
5. Tile drainage appeared to improve the support for harvest equipment where the drains were placed deeper than two feet. There was no yield advantage from tile drains that could be measured at the one site where they were installed.

A conclusion concerning productivity may also be drawn from this research. Yields were greatly reduced if row crop production was initiated immediately after reclamation without the benefit of a winter's freezing and thawing. After a period of one or two years, yields from reclaimed borrow areas may equal county wide yields if at least six inches of topsoil were restored to glacial till sites. At coarse-textured or loess sites, topsoil may not be necessary to achieve county yield averages.